CLAIMS

What is claimed is:

1   1.   A system for optimizing non-interactive three-dimensional image data comprising:

2   an optimizing encoder for generating three-dimensional rendering information optimized

3   for real-time rendering of an image having an image quality within an error criteria of an image

4   quality standard for a target computer system, and the optimizing encoder further having a model

5   representing the target computer system for performing rendering of the rendering information,

6   the target computer system represented being a type of computer system having a three-

7   dimensional renderer.

1   2.   The system of claim 1 wherein the optimizing encoder performs an optimization of the

2   three-dimensional rendering information based upon criteria including a graphics processor

3   capability of the target computer system.

1   3.   The system of claim 2 wherein the optimizing encoder performs an optimization of the

2   three-dimensional rendering information based upon criteria including characteristics of a

3   physical infrastructure for transferring the optimized three-dimensional rendering information to

4   the target computer system.

1   4.   The system of claim 3 wherein the physical infrastructure is the Internet.

1   5.   The system of claim 3 wherein the physical infrastructure is a digital versatile disc.

1   6.   The system of claim 3 wherein the computer system is an interactive game console.

1   7.   The system of claim 2 wherein the optimizing encoder performs an optimization of the

2   three-dimensional rendering information based upon criteria including feedback information

3   generated by the model during rendering of the three-dimensional rendering information.

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1   8.   The system of claim 7 wherein the feedback information includes a rendering time

2   measurement for a subset of a scene.

1   9.   The system of claim 7 wherein the feedback information includes a rendering time

2   measurement for a scene.

1   10.   The system of claim 7 wherein the optimizing encoder has a memory and the feedback

2   information.includes rendered pixels generated by the model in rendering the optimized three-

3   dimensional rendering information.

1   11.   The system of claim 7 wherein the feedback information includes command error

2   reporting.

1   12.   The system of claim 7 wherein the optimizing encoder has a processor and a memory and

2   the model is a software emulation of the target computer system executing on the processor for

3   rendering three-dimensional rendering information.

1   13.   The system of claim 7 wherein the model comprises a graphics processor for rendering

2   the optimized three-dimensional image data.

1   14.   The system of claim 7 wherein the model is a graphics sub-system embodied in a

2   peripheral of the optimizing encoder.

1   15.   The system of claim 1 wherein the optimizing encoder comprises:

2   an import unit for converting three-dimensional descriptions to an intermediate

3   format suitable for a plurality of target computer systems;

4   a multi-platform unit for generating a first optimized three-dimensional data set

5   by performing computations applicable to a plurality of target computer systems;

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6   a target-specific optimization unit for generating a second optimized three-

7   dimensional data set for a selected one of the target computer systems by performing at

8   least one optimization applicable to the selected target system; and

9   a bandwidth tuning unit for encoding the second optimized three-dimensional data

10   set in a three-dimensional protocol accounting for the characteristics of a physical infrastructure

11   from which the selected target computer system will access the second data set.

1   16.   A method for optimizing non-interactive three-dimensional image data for rendering by a

2   target computer system comprising:

3   generating three-dimensional rendering information optimized for real-time rendering of

4   an image having an image quality within an error criteria of an image quality standard for the

5   target computer system, the target computer system represented being a type of computer system

6   having a three-dimensional renderer; and

7   encoding the optimized three-dimensional image data into a three-dimensional protocol.

1   17.   The method of claim 16 wherein the three-dimensional protocol is a streaming protocol.

1   18.   The method of claim 16 wherein generating three-dimensional rendering information

2   optimized for real-time rendering of an image having an image quality within an error criteria of

3   an image quality standard for the target computer system comprises:

4   performing an optimization based upon the graphics processor capability of the target

5   computer system.

1   19.   The method of claim 16 wherein generating three-dimensional rendering information

2   optimized for real-time rendering of an image having an image quality within an error criteria of

3   an image quality standard for the target computer system comprises:

4　　receiving feedback information from a rendering of the image by a model of the target

5　system; and

6　　selecting an optimization to be performed based on the feedback information.

1　20.　The method of claim 16 wherein the encoding of the optimized three-dimensional image

2　data into a three-dimensional protocol comprises:

3　　encoding the rendering information to satisfy the bandwidth requirement of a physical

4　infrastructure used for transferring the optimized information to the target computer system.

1　21.　The method of claim 16 wherein generating three-dimensional rendering information

2　optimized for real-time rendering of an image having an image quality within an error criteria of

3　an image quality standard for the target computer system comprises the following:

4　　converting three-dimensional descriptions to an intermediate format suitable for a

5　plurality of target computer systems;

6　　generating a first optimized three-dimensional data set by performing

7　computations applicable to a plurality of target computer systems;

8　　generating a second optimized three-dimensional data set for a selected one of the

9　target computer systems by performing at least one optimization applicable to the

10　selected target system; and

11　　encoding the second optimized three-dimensional data set in a three-dimensional

12　protocol accounting for the characteristics of a physical infrastructure from which the

13　selected target computer system will access the second data set.

1　22.　The method of claim 21 wherein the at least one optimization is an optimization based on

2　microcode generation.

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1   23.   The method of claim 21 wherein the at least one optimization is an optimization

2   involving injecting corrective data

1   24.   The method of claim 21 wherein the at least one optimization is an optimization based on

2   scheduling of object rendering and reordering of objects to be rendered.

1   25.   The method of claim 21 wherein the at least one optimization is an image based

2   rendering technique.

1   26.   The method of claim 21 wherein the at least one optimization is an optimization

2   involving deletion of unused data or delaying of rendering of data.

1   27.   The method of claim 21 wherein the at least one optimization is an optimization

2   involving pre-computing runtime parameters.

1   28.   The method of claim 21 wherein the at least one optimization is an optimization

2   involving optimizing assets.

1   29.   The method of claim 21 wherein the at least one optimization is an optimization

2   involving texture creation.

1   30.   The method of claim 21 wherein the at least one optimization is an optimization

2   involving shading computations.

1   31.   The method of claim 21 wherein the at least one optimization is an optimization

2   involving manipulating geometry of objects within the image.

1   32.   The method of claim 21 wherein the at least one optimization is an optimization

2   involving visibility determination of objects within the image.

1   33.   The method of claim 21 wherein the at least one optimization is an optimization

2   involving compression.

1 34. A system for optimizing non-interactive three-dimensional image data for rendering by a

2 target computer system comprising:

3   means for generating three-dimensional rendering information optimized for real-time

4 rendering of an image having an image quality within an error criteria of an image quality

5 standard for the target computer system, the target computer system represented being a type of

6 computer system having a three-dimensional renderer; and

7   means for encoding the optimized three-dimensional image data into a three-dimensional

8 protocol.

1 35. A computer usable medium comprising instructions that when executed by a processor

2 perform the following method for optimizing non-interactive three-dimensional image data for

3 rendering by a target computer system comprising:

4   generating three-dimensional rendering information optimized for real-time rendering of

5 an image having an image quality within an error criteria of an image quality standard for the

6 target computer system, the target computer system represented being a type of computer system

7 having a three-dimensional renderer; and

8   encoding the optimized three-dimensional image data into a three-dimensional protocol.